WHAT IS CLAIMED IS:

1. A method of treating cancer in a human, which comprises administering to the human a combination of (i) a therapeutically effective amount of one or more arsenic compounds, and (ii) radiation.

2. The method of claim 1, wherein the arsenic compound is arsenic trioxide.

3. The method of claim 2, wherein the arsenic trioxide is formulated as an ionic aqueous solution.

4. The method of claim 1, wherein the total daily amount administered of the arsenic compound is from about 10 g to about 200 mg.

5. The method of claim 1, wherein the total daily amount administered of the arsenic compound is from about 0.5 mg to about 150 mg.

6. The method of claim 1, wherein the total daily amount administered of the arsenic compound is from about 0.5 mg to about 70 mg.

7. The method of claim 1, wherein the arsenic compound is administered parenterally.

8. The method of claim 1, wherein the arsenic compound is administered intravenously.

9. The method of claim 1, wherein the radiation and the arsenic compound are administered in combination with an effective amount of at least one further therapeutic agent.

10. The method of claim 9, wherein the further therapeutic agent is a chemotherapeutic or radiotherapeutic.

11. The method of claim 9, wherein the further therapeutic agent is selected from the group consisting of etoposide, cisplatin, carboplatin, estramustine phosphate, vinblastine, methotrexate, hydroxyurea, cyclophosphamide, doxorubicin, 5-fluorouracil, taxol, diethylstilbestrol, VM-26(vumon), BCNU, all-trans retinoic acid, procarbazine, cytokines, therapeutic vaccines, and immunomodulators.

12. The method of claim 2, wherein the dose is varied according to the body weight of the human.

13. The method of claim 2, wherein the cancer is a hematopoietic cancer.

14. The method of claim 2, wherein the cancer is a leukemia.

15. The method of claim 14, wherein the leukemia is an acute myelogenous leukemia.

16. The method of claim 14, wherein the leukemia is a chronic myelogenous leukemia.

17. The method of claim 2, wherein the cancer is a lymphoma.

18. The method of claim 2, wherein the cancer is a solid tumor.

19. The method of claim 2, wherein the cancer has metastisized.

20. The method of claim 2, wherein the radiation is administered prior to the arsenic trioxide.

21. The method of claim 2, wherein the radiation is administered after the arsenic trioxide.

22. The method of claim 2, wherein the radiation and the arsenic trioxide are administered concurrently.

23. The method of claim 2, wherein said cancer is a tumor of the central nervous system selected from the group consisting of neuroblastoma, retinoblastoma, glioblastoma or oligodendroglioma.